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CAPTURING TEST/EMULATION AND ENABLING REAL-TIME DEBUGGING USING AN FPGA FOR IN-CIRCUIT EMULATION

ABSTRACT OF THE DISCLOSURE

A method for obtaining real-time debug information, e.g., state information and trace information, from an FPGA acting as a virtual microcontroller that is attached to a microcontroller under test. The two devices, the microcontroller and the FPGA execute the same instructions in lock-step with the FPGA acting as an emulator. The FPGA emulates the actual microcontroller and relieves the actual microcontroller from having debug logic installed thereon. FPGA and microcontroller, are coupled using a four pin interface. The FPGA is directly coupled to the PC for both programming and control. The system is implemented such that the microcontroller forwards information regarding I/O reads, interrupt vector information and watchdog information to the FPGA in time before the execution of the next instruction. Thus, the FPGA has an exact copy of the state information of the microcontroller.